

*Important information about upcoming regulations*

## Strengthening protection against microbial contaminants

### ■ USEPA finalizes Long Term 2 Enhanced Surface Water Treatment Rule and Stage 2 Disinfectants and Disinfection Byproducts Rule

The new regulations - Long Term 2 Enhanced Surface Water Treatment Rule and Stage 2 Disinfectants and Disinfection Byproducts Rule - strengthen protection against microbial contaminants, especially *Cryptosporidium*, and at the same time, reduce potential health risks of disinfection byproducts (DBPs).

*This article provides a simplified overview of these rules that will help water system decision makers plan for upcoming requirements.*

#### Early Implementation

Because of agreements reached during national negotiations, these two rules contain requirements that begin to take effect before Idaho will be able to adopt the rules and obtain primacy for implementation. For this reason, US EPA Region 10 will be working directly with the larger Idaho systems that have requirements during the next two years.

EPA has already sent preliminary information on these rules to systems serving 50,000 or more customers. Systems serving between 10,000 and 49,999 customers will receive an EPA mailing later this summer.

#### □ Long Term 2 Enhanced Surface Water Treatment Rule (LT2)

The purpose of the LT2 rule is to reduce illness linked to *Cryptosporidium* and other pathogenic microorganisms in drinking water.

All public water systems that use surface water, including sources declared groundwater under the direct influence of surface water, will be required to comply with the rule.

Compliance consists of monitoring source waters and, if required, installation of additional *Cryptosporidium* treatment capabilities.

**Monitoring:** Under the LT2, systems will monitor their water sources to determine treatment requirements. For water systems that serve 10,000 or more people monitoring includes an initial two years of monthly sampling for *Cryptosporidium*, *E. coli*, and turbidity.

To reduce monitoring costs, filtered water systems that serve less than 10,000 people will first monitor only for *E. coli*, which is less expensive to analyze than *Cryptosporidium*. Systems will monitor for *Cryptosporidium* only if their *E. coli* results exceed specified concentration levels.

Monitoring starting dates are staggered by system size, with smaller systems beginning monitoring after larger systems.

LT2 Monitoring Schedule			
Population Served	Submit source water sampling schedule	Begin source water sampling	Comply with <i>Cryptosporidium</i> treatment requirements*
≥ 100,000	July 1, 2006	October 1, 2006	April 1, 2012
50,000 - 99,999	January 1, 2007	April 1, 2007	October 1, 2012
10,000 - 49,999	January 1, 2008	April 1, 2008	October 1, 2013
≤ 10,000	July 1, 2008	October 1, 2008	October 1, 2014
*States may allow up to an additional two years to comply with a treatment requirement for water systems making capital improvements.			

***Cryptosporidium* treatment:** Filtered water sources will be classified in one of four treatment categories (bins) based on their monitoring results. The majority of systems are expected to be classified in the lowest treatment bin, which carries no additional treatment requirements.

Systems classified in higher treatment bins must provide additional treatment for *Cryptosporidium*.

Systems will be able to select from a wide range of treatment and management strategies in the "microbial toolbox" to meet their additional treatment requirements.

## □ Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBP)

The Stage 2 DBP rule was developed to reduce potential cancer, reproductive and developmental health risks from disinfection byproducts (DBPs) in drinking water.

Community and non-transient non-community water systems that distribute water to which a chemical disinfectant has been added, including water systems that do not treat but only distribute disinfected water, are required to comply with this rule.

**DBPs form when chemical disinfectants, which are used to control microbial pathogens or for other treatment purposes, combine with naturally occurring organic compounds in source waters.**

**Monitoring:** The Stage 2 D/DBPR targets water systems with the greatest DBP risk by requiring all distribution system

sampling locations to be in compliance with the maximum contaminant levels (MCLs) of 80 parts per billion (ppb) for total trihalomethanes (TTHMs) and 60 ppb for the regulated haloacetic acids (HAAs).

This approach differs from current requirements, which determine compliance by averaging DBP concentrations across the distribution system. It also provides more equitable public health protection for water systems that collect multiple samples when they monitor for DBPs.

**Initial Distribution System Evaluation:** Under the Stage 2 D/DBPR, water systems may be required to conduct an evaluation of their distribution systems, known as an Initial Distribution System Evaluation (IDSE), to identify the locations with high disinfection byproduct concentrations.

These locations will then be used by the systems as the sampling sites for Stage 2 D/DBPR compliance monitoring. *There are IDSE waivers available for very small water systems and those with consistently low DBP concentrations throughout their distribution systems.*

**Operational evaluation levels:** The Stage 2 DBP rule also requires each system to determine if they have exceeded an operational evaluation level, which is identified using their compliance monitoring results. The operational evaluation level provides an early warning of possible future MCL violations.

A system that exceeds an operational evaluation level is required to review their operational practices and submit a report to their state that identifies actions that may be taken to mitigate future high DBP levels, particularly those that may jeopardize their compliance with the DBP MCLs.

Compliance deadlines are based on water system size, with the largest systems required to take action first. Compliance activities are outlined in the following table.

Stage 2 DBP Monitoring/Reporting Schedules				
Population Served	Submit IDSE monitoring plan or IDSE	Complete IDSE	Submit IDSE Report	Begin Stage 2 compliance monitoring
≥ 100,000	October 1, 2006	Sept 30, 2008	Jan 1, 2009	April 1, 2012
50,000 - 99,999	April 1, 2007	March 31, 2009	July 1, 2009	October 1, 2012
10,000 - 49,999	October 1, 2007	Sept 30, 2009	January 1, 2010	October 1, 2013
≤ 10,000	April 1, 2008	March 31, 2010	July 1, 2010	October 1, 2013*
*Small water systems with filtered surface water sources that exceed the <i>E. coli</i> triggers in the LT2ESWTR will have until 10/01/2014 to begin Stage 2 compliance monitoring.				

Wholesale and consecutive systems of any size must comply with the requirements of the Stage 2 DBP rule on the same schedule as required for the largest system in the combined distribution system.

Systems with questions for both rules should contact the resources below. ■

## Resources

- If you have questions about these rules, you may contact any of the following:
  - Your District Health or DEQ Regional Office
  - Wendy Marshall, Region 10 EPA at 206-553-1890 or e-mail her at this address: [Marshall.Wendy@epamail.epa.gov](mailto:Marshall.Wendy@epamail.epa.gov)
  - Tom John at 208-373-0191 or [Thomas.John@deq.idaho.gov](mailto:Thomas.John@deq.idaho.gov)
- Guidance manuals, fact sheets, and additional information about these rules can be obtained from the following EPA websites:
  - EPA Headquarters: <http://www.epa.gov/safewater/disinfection/index.html>
  - EPA Region 10: <http://yosemite.epa.gov/R10/WATER.NSF> and click on the Drinking Water link.



**Remember**, the Idaho Drinking Water Newsletter is available in electronic and hard copy formats. To view the newsletter online, go to [www.deq.idaho.gov/water/assist\\_business/pws/newsletter.cfm](http://www.deq.idaho.gov/water/assist_business/pws/newsletter.cfm).

## Water treatment plant awards - Year 3

EPA's Area Wide Optimization Program (AWOP) is designed to assist public surface water treatment plants that use coagulation and filtration to improve their treatment performance.

AWOP targets higher risk systems for assistance to maximize (optimize) the public health protection that water treatment plants provide. The primary benefit of an AWOP is improved protection against waterborne disease.

### Reminder

## Sampling for VOCs and DBPs are separate requirements

It has recently come to DEQ's attention that some water systems may be using entry point VOC sample total trihalomethanes results for purposes of compliance with the Disinfectants and Disinfection Byproducts Rule (DBP Rule). This is not appropriate.

■ **VOCs.** Public water systems are required to sample for certain volatile organic substances (VOCs) under the Phase II/Phase V Rule. *These samples are taken at the entry to the distribution system* and are intended to detect contamination in the systems source of drinking water.

■ **DBPs.** The DBP Rule requires public water systems that practice chemical disinfection to monitor for disinfection byproducts, including total trihalomethanes and a group of five haloacetic acids.

*These samples are taken within the distribution system* at a point judged to represent the longest retention time. For most systems, DBP sampling is done at the time of warmest water temperatures, usually late summer or early fall. The intent of this sampling is to measure changes in the quality of disinfected water during distribution.

■ **Sampling requirements differs.** Sampling for compliance with these two rules serves different purposes and occurs at different frequencies and at different locations within the water system. Results from the two sampling activities are not interchangeable.

*If your system has been using VOC data to substitute for DBP sampling,* you should contact your DEQ or District Health Department representative to obtain instructions on how to correct your practices and come into compliance with these two rules. ■

### EPA initiates AWOP

EPA initiated the AWOP program in the 1990s and EPA's Region 10 began promoting Area Wide Optimization in the northwest in December 2002. In the spring of 2003, Idaho submitted an AWOP work plan to Region 10 proposing use of the state's capacity development funds for surface water treatment plant optimization.

Idaho AWOP staff has just completed its third year of data collection and water treatment plant prioritization. Treated (or "finished") water turbidity is the principal criterion AWOP uses for assessing plant performance.

### Achievement Awards

Each year, DEQ presents Certificates of Achievement to water treatment plants based on their annual system performance. To receive this award a plant must first achieve a finished water turbidity of 0.1 NTU (Nephelometric Turbidity Units) or lower at least 95% of the time. In addition, they must meet other stringent criteria related to public health protection.

In May 2006, DEQ presented Certificates of Achievement to six water treatment plants based on their optimization performance from July 2004 through June 2005. The six plants receiving this award are shown below:

- City of Lewiston
- City of McCall
- City of Sandpoint (Lake Plant)
- City of Sandpoint (Sand Creek Plant)
- United Water – Marden Plant
- City of Priest River

Four of these plants (Lewiston, McCall, and the City of Sandpoint's Lake, and Sand Creek plants) achieved a turbidity of 0.1 NTU or lower 100% of the time.

Achieving such consistent high quality is the mark of a highly dedicated and skilled water department staff. DEQ commends these plants for their accomplishments. ■

One of the most cost-effective ways a state can improve an existing water treatment plant's ability to protect public health is to maximize the performance of treatment technology already in place.

**New!** DEQ's Frequently Asked Questions about your drinking water:

[www.deq.idaho.gov/water/prog\\_issues/drinking\\_water/faqs.cfm](http://www.deq.idaho.gov/water/prog_issues/drinking_water/faqs.cfm)



DEPARTMENT OF  
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# Drinking water, submersible pumps, and mercury seals: A potential problem

**G**roundwater supplies about 95% of Idaho's drinking water. The pumps used to supply ground and surface water play an important role in water distribution systems.

Probably the most commonly used water pump in Idaho is the submersible pump, which is used mostly for pumping groundwater. The larger, higher capacity wells generally use the vertical turbine pump, however, some surface water wells are also fitted with high capacity submersible pumps.

## Submersible pumps

The submersible pump is a pump and motor combination designed to be placed entirely below the water surface, and is typically four inches or larger in diameter and specially designed to fit into a water well casing.

All pumps used for drinking water employ some type of a seal, between the pump and motor, to prevent the water being pumped from entering the motor and causing a short circuit. The majority of pumps use some type of a mechanical seal, but the design of some submersible pumps incorporate a mercury seal.

Submersible pumps with a mercury seal are a concern because of the possibility of contamination if the seal is broken and the mercury spills into the well. Mercury is a dangerous contaminant because exposure can permanently damage the brain, kidneys, and developing fetuses.

This handout examines the necessary precautions system owners and operators should take if they are using mercury seal pumps.

## Recent mercury spills in Idaho

In the past, some public drinking water systems in Idaho have experienced mercury seal breakages. Seal breakages can be the result of in-well failure, but spills frequently occur when the pump is pulled for repairs. In separating the pump from the motor, the seal may be accidentally broken spilling mercury into the well.

In April 1993, when the pump at one of the city of Coeur d'Alene's wells stopped working, the city sent a contractor out to remove the pump for repair. When the contractor separated the pump from the motor, about eight pounds of mercury from the seal accidentally spilled into the well.

The city shipped the motor out for repair and then attempted to recover the mercury from the bottom of the well. When this was unsuccessful, the city sealed the mercury off from the rest of the well using bentonite ("driller's mud").

## The dangers of mercury

Pure mercury is a liquid metal (sometimes referred to as quicksilver) used to make products such as thermometers, switches, and some light bulbs. Mercury is also used in seals in some submersible water pumps.

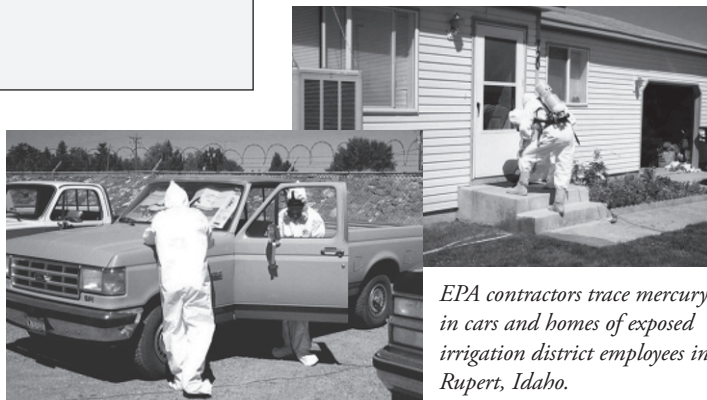
Although metallic mercury may look fun to play with, mercury can evaporate into a toxic, odorless, colorless gas when exposed to air. If inhaled or absorbed over time, mercury vapors can result in tremors, insomnia, headaches, and can damage the brain, central nervous system, and other organs. Children, babies, and pregnant women are especially at risk.

You can help reduce mercury incidents by purchasing mercury-free products and correctly disposing of products that contain mercury.

Contact your local landfill or DEQ regional office for proper disposal in accordance with local, state, and federal laws.

After the rebuilt motor was reinstalled, tests showed mercury in the range of 50 ppb (parts per billion) (the MCL [maximum contaminant level] is 2 ppb). So the city took the next step and began flushing the well and, with DEQ approval, discharging into the sanitary sewer. Within a month, tests showed the levels were back to non-detect and the well went back on-line.

In August 2000, near Rupert, Idaho a mercury spill occurred involving, in this case, a turbine pump. About 12 pounds of mercury spilled from the pump's bearing seal when an irrigation district removed the pump for maintenance. Five irrigation district employees attempted to clean up the mercury spill by hand. Later that day the employees unknowingly tracked the mercury home, but immediate action by EPA resulted in remediation within hours of several vehicles and two homes.



EPA contractors trace mercury in cars and homes of exposed irrigation district employees in Rupert, Idaho.

## Precautions to take when repairing submersible pumps

To remove a submersible pump, it is often necessary to break the pump down into several components. If the pump is disassembled directly below the seal, mercury may be exposed and spill into the well and the drinking water.

Operators should follow the best management practices listed below if they are using a mercury seal pump:

- **Be aware of mercury seals in your system.** Check to see if any submersible well pumps used in your system contain a mercury seal. Equipment specifications or manuals, pump manufacturers, and vendors will be the sources of this information.
- **Read instructions before pulling a mercury seal pump.** Consult the pump manual for removal instructions if a pump must be pulled for repair or maintenance. (Most failures of submersible pumps are due to electrical problems with the motors.)

Pumps can often be broken down into sections for easier removal. Disassembly may expose the mercury seal; incorrect disassembly may cause mercury to spill. Use a barrier, such as an impermeable tarp, to protect the well-head in case of spill.

- **Purchase a mercury spill kit.** Have a mercury spill cleanup kit on site and train staff in its use. Mercury spill kits are available commercially and will usually include a small pump, nitrile gloves, and sponges impregnated with a special material to absorb mercury, which can be used to wipe up the area of a small spill.



Photo courtesy Forestry Suppliers, Inc. used by permission. 570006\*

- **Educate staff.** Train staff in safe mercury management, spill clean-up processes, and safe disposal procedures.
- **Consider replacing mercury seal pumps.** When feasible, replace equipment with non-mercury alternatives. (Some pump companies will convert a pump with a mercury seal to a mechanical seal.)
- **Know how to dispose of mercury.** Dispose of mercury and mercury-containing equipment according to federal, state, and local regulations. Check with your local landfill or DEQ regional office for assistance in identifying disposal and recycling options.

## Costs involved as well as health hazards

Not only are there health hazards associated with mercury spills, but cleanup and disposal costs figure in as well. Cleanup costs associated with mercury spills can include incident response and worker decontamination (as in the Rupert incident), and cleanup, removal, and disposal of the mercury from the well and surrounding soils.

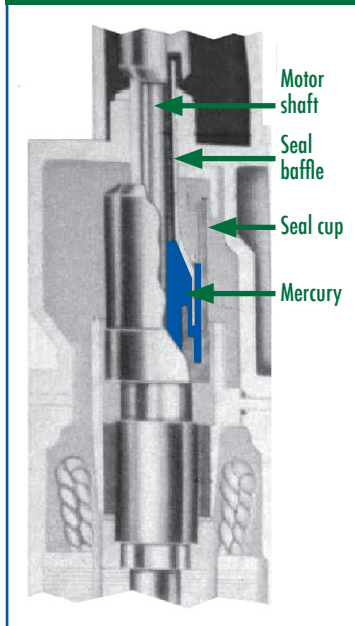
If mercury spills into the well, the existing well may need to be sealed and a new well drilled resulting in additional costs. Communities also may need to supply emergency water supplies for customers.

## Summary

Are submersible pumps with mercury seals a thing of the past? Not necessarily, because there are still older pumps in use that contain mercury seals. And there is one major manufacturer of submersible pumps that continues to sell a pump model with a mercury seal (the firm also sells submersible pumps with mechanical seals).

As old mercury seal pumps malfunction and they are repaired or replaced, there is always the danger of a mercury spill into the drinking water well when removing the pump. Eventually, mercury contamination of a well may not be the problem that it once was as mercury seal pumps are replaced by pumps with mechanical seals. In the meantime, if systems are still using pumps with mercury seals, they must take the precautions discussed above to protect themselves and their customers. ■

**Cutaway of Submersible Pump showing location of mercury seal**



## Idaho's Rules for Public Drinking Water Systems

**do not mention mercury seals, but Question #14 on DEQ's "Drinking Water Well House and Equipment Design Checklist" for the design of new facilities asks if the system is using submersible pumps with mercury seals. If the system checks "yes" the checklist asks if there are "procedures for removing pumps to prevent loss of mercury in the system's operation and maintenance manual."**

\*Note: Provided for information only. DEQ does not endorse any particular brand, product, service, or company.

## Training Schedule

### Class Sponsor

### Location/Date

<i>Management/Finance Workshop (IRWA) - W/WW</i>	<i>Kellogg, July 11, 2006</i>
<i>Hands-On Lab/DEQ Rules Workshop (IRWA) - W/WW</i>	<i>Coeur d'Alene, July 13, 2006</i>
<i>Cross Connection Control Workshop (IRWA) - W</i>	<i>Chubbuck, July 19, 2006</i>
<i>Fire Hydrant/Valve Workshop (IRWA) - W</i>	<i>Soda Springs, July 20, 2006</i>
<i>Management and Leadership (BE) - W/WW</i>	<i>Boise, July 26-27, 2006</i>
<i>Pumps and Motors (BE) - W/WW</i>	<i>Lewiston, August 2-3, 2006</i>
<i>Small Water System Sanitary Survey/O&amp;M (BE) - W</i>	<i>Twin Falls, August 16, 2006</i>
<i>Leak Detection (BE) - W</i>	<i>Boise, August 29, 2006</i>
<i>Small Water System O&amp;M (BE) - W</i>	<i>Fruitland, September 26, 2006</i>
<i>Sampling Plan Development (BE) - W</i>	<i>Caldwell, September 27, 2006</i>

(BE) = Brown Environmental, Inc.  
(IRWA) = Idaho Rural Water Association,

*For further information, contact the following:*

**Brown Environmental, Inc.** 1-800-543-4358 or for the Boise area, 1-208-465-5725.  
Fax: 1-208-465-8081.  
Web site: [www.idahooperatortraining.com](http://www.idahooperatortraining.com).

**Idaho Rural Water Association** 1-800-962-3257 or 1-208-343-7001.  
Fax: 1-208-343-1866. E-mail: [d.sauer@idahoruralwater.com](mailto:d.sauer@idahoruralwater.com)  
Web site: [www.idahoruralwater.com](http://www.idahoruralwater.com).



### Safe Drinking Water Hotline

For general information  
on drinking water call:

**1-800-426-4791**

Monday - Friday, 9am - 5pm EST  
(excluding Federal holidays)

or contact EPA's Safe Drinking Water Hotline web site at:

[www.epa.gov/safewater/hotline/](http://www.epa.gov/safewater/hotline/)

